

DANGEROUS GOODS PANEL

Dubai, 31 March to 4 April 2003

Agenda Item 3: Resolution, where possible, of the non-recurrent work items identified by the (ANC) or the panel

3.1 Packing Instructions

:

REFORMATTING OF PACKING INSTRUCTIONS - COMPATIBILITY

(Presented by D. Raadgers)

1. BACKGROUND

1.1 The first version of the proposed modifications was presented by the working group Packing Instructions during the meeting in Frankfurt of the Working Group of the Whole in September 2002. At this meeting of the working group, different members gave their comments on this first version. The Dutch delegation has made a restriction on the subject of compatibility and said they would comment on this subject after advice from the Netherlands Packaging Authority (NPA).

2. INTRODUCTION

2.1 Packing Instructions for classes 3, 4 and 5 have existed for years and the historical information for this detailed division was unknown. In many cases it seemed that the detailed division was based on the then existing state of knowledge of the compatibility of the chemicals with the packing material. Important to the considerations to come to the adaptation of these detailed Packing Instructions, is that in the present Packing Instructions the compatibility of packaging is an important part of the detailed division. Also the compatibility is still a very actual and relevant safety item.

2.2 In the concept proposals of the working group on the Packing Instructions, it is proposed to include the requirements of compatibility only in the general requirements of the Packing instructions of the classes involved. Also, the whole requirements are laid down at the shipper's responsibilities.

2.3 The Netherlands Packaging Authority (NPA) has examined this part of the proposals. The proposals are a strong simplification of the actual detailed Packing Instructions, so that's why it is necessary

to take more detailed obliged conditions in the general requirements. These detailed obliged conditions can give the shipper a legal frame to which at least must be complied with the considerations of the compatibility of chemicals and packaging. The Dutch delegation introduces the following amendment.

3. PROPOSAL

3.1 The Dutch delegation is looking for consensus on the proposals made by the working group Packing Instructions. This is the reason we propose to the working group Packing Instructions and the DG panel to incorporate the next text in the definitive proposals of the working group Packing Instructions as presented in working paper 51, Dubai.

3.2 The interaction between the packed chemical substance and the packaging material can influence the mechanical properties and thus the performance of the packaging. This can lead to failure of the packaging under certain conditions. This interaction often is a complex process which is influenced by a number of parameters like physical and chemical properties of the packed substance, temperature and duration of the interaction process (and thus the duration of the transport). The exact composition of the product must thus be known for the evaluation of the interaction process.

3.3 Further it is emphasised that the interaction not only takes place between the chemical substance and the material of the packaging itself, but also between the chemical substance and other parts of the packaging like the closure and its gaskets.

There are basically two ways to approach the problem of this interaction process:

1. Testing of the package filled with the dangerous product as prepared for transport. In this procedure the package is stored for a time period and at conditions representative for the transport. In some cases the storage period can be decreased by accelerating the process by increasing the temperature. After the storage the package is evaluated visually and/or by testing the mechanical performance.
2. Using the knowledge which has been built up on the interaction of the substance concerned or on similar substances with the same or a similar packaging. This knowledge, which can also have been gained by transport experience, may be available at the producer of the chemical substance, the shipper, the manufacturer of the packaging or at test institutes.

In order to judge if problems by interaction can be expected, the following guidelines are of importance:

1. For glass, all substances containing the element fluorine can lead to chemical attack of the packaging material by the substance. These combinations must thus be avoided.
2. Metals like steel and aluminium are susceptible to corrosion. Substances with corrosive properties against such materials (generally classified in class 8), including acids and alkaline substances, should not be packed in metal packaging and it is recommended not to do this

even when a protective coating is present. Further investigations are necessary when a substance containing water is packed in a metal packaging.

3. Relevant interactions for widely used polymer materials like polyethylene and polypropylene are swelling, chemical degradation and environmental stress cracking. Further investigation is deemed necessary when the swelling rate is higher than 1%, as is the case for many organic substances. In this case permeation of the substance through the packaging material can also be expected, which can lead to dangerous situations in practice. Chemical degradation can occur by interaction with highly oxidising acids like nitric acid and further investigations are deemed necessary for these substances. For organic liquids with low swelling rates (less than 4%) environmental stress cracking is a potential problem.

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